

<b>Candidate Forename</b>		<b>Candidate Surname</b>	
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<b>Centre Number</b>						<b>Candidate Number</b>				
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**OXFORD CAMBRIDGE AND RSA EXAMINATIONS  
GENERAL CERTIFICATE OF SECONDARY EDUCATION**

**B282A**

**MATHEMATICS C  
(GRADUATED ASSESSMENT)**

**Terminal Paper – Section A (Higher Tier)**

**MONDAY 7 JUNE 2010: Afternoon**

**DURATION: 1 hour**

**SUITABLE FOR VISUALLY IMPAIRED CANDIDATES**

**Candidates answer on the Question Paper**

**OCR SUPPLIED MATERIALS:**

**None**

**OTHER MATERIALS REQUIRED:**

**Geometrical instruments**

**Tracing paper (optional)**

**WARNING**

**No calculator can be used for  
Section A of this paper.**

**READ INSTRUCTIONS OVERLEAF**

## **INSTRUCTIONS TO CANDIDATES**

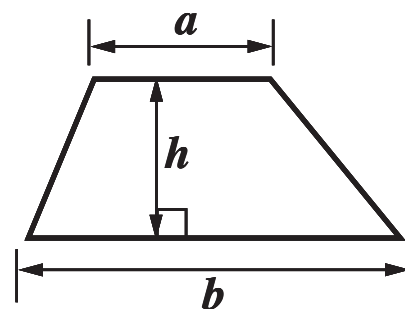
- **Write your name clearly in capital letters, your Centre Number and Candidate Number in the boxes on the first page.**
- **Use black ink. Pencil may be used for graphs and diagrams only.**
- **Read each question carefully and make sure that you know what you have to do before starting your answer.**
- **Show your working. Marks may be given for a correct method even if the answer is incorrect.**
- **Answer ALL the questions.**
- **Write your answer to each question in the space provided. Additional paper may be used if necessary but you must clearly show your Candidate Number, Centre Number and question number(s).**

## **INFORMATION FOR CANDIDATES**

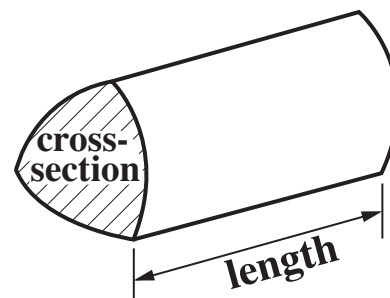
- **The number of marks is given in brackets [ ] at the end of each question or part question.**
- **The total number of marks for this Section is 50.**

## FORMULAE SHEET

**Area of trapezium** =  $\frac{1}{2} (a + b)h$



**Volume of prism** = (area of cross-section)  $\times$  length

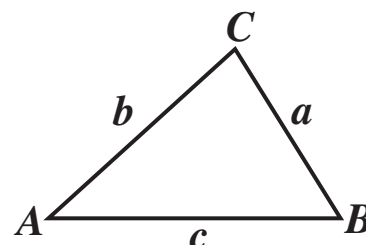


**In any triangle ABC**

**Sine rule**  $\frac{a}{\sin A} = \frac{b}{\sin B} = \frac{c}{\sin C}$

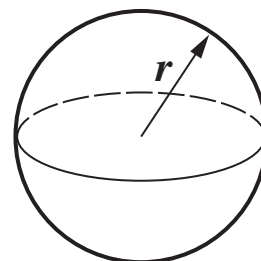
**Cosine rule**  $a^2 = b^2 + c^2 - 2bc \cos A$

**Area of triangle** =  $\frac{1}{2} ab \sin C$



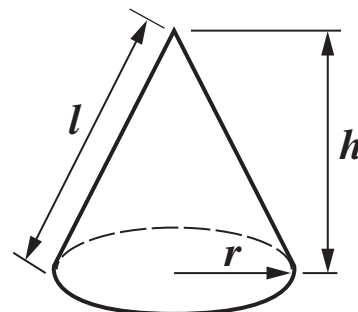
**Volume of sphere** =  $\frac{4}{3}\pi r^3$

**Surface area of sphere** =  $4\pi r^2$



**Volume of cone** =  $\frac{1}{3}\pi r^2 h$

**Curved surface area of cone** =  $\pi r l$



**The Quadratic Equation**

The solutions of  $ax^2 + bx + c = 0$ , where  $a \neq 0$ , are given by

$$x = \frac{-b \pm \sqrt{b^2 - 4ac}}{2a}$$

**1 Work out.**

$$\frac{4}{5} - \frac{3}{7}$$

**[2 marks]**

\_\_\_\_\_

**2 (a) The  $n$ th term of a sequence is  $5n - 2$ .**

**Work out the first 3 terms.**

**[2 marks]**

**(a)** \_\_\_\_\_

**(b) These are the first 5 terms of a different sequence.**

**7            11            15            19            23**

**Find an expression for the  $n$ th term of this sequence.  
[2 marks]**

**(b) \_\_\_\_\_**

**3 Solve.**

$$5n + 7 = 2n - 5$$

**[3 marks]**

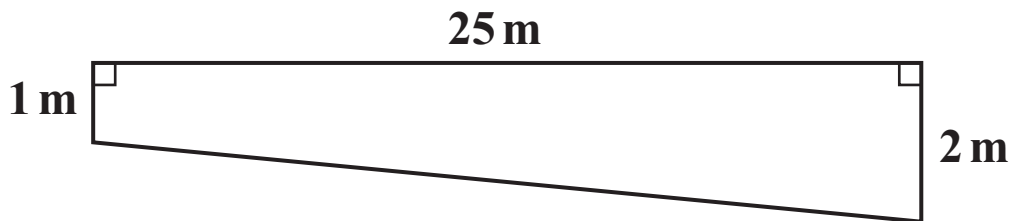
\_\_\_\_\_

- 4 (a) The length of a swimming pool is 25 m.  
James wants to swim a total distance of 1.2 km.

How many lengths will he need to swim?  
[3 marks]

(a) \_\_\_\_\_

- (b) The cross-section of the swimming pool is a trapezium.

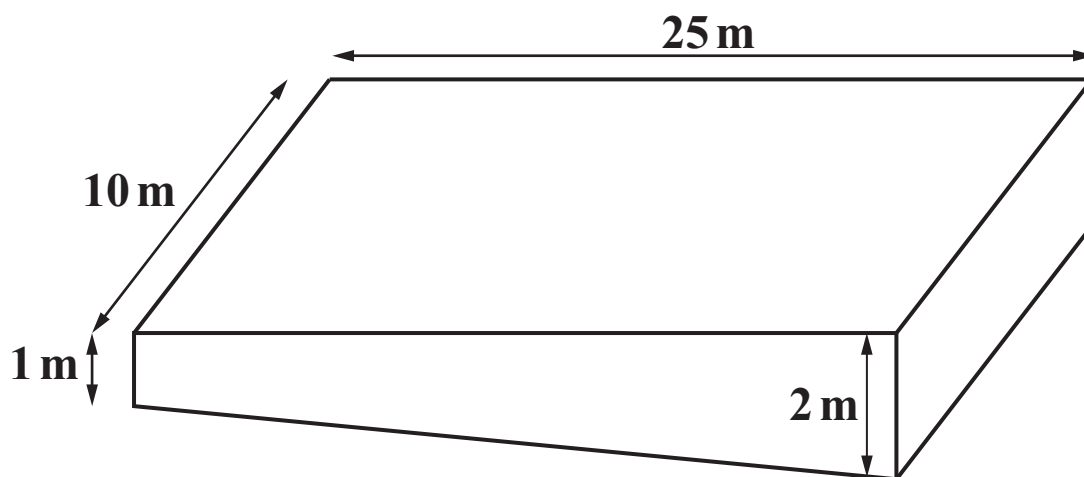


Not to scale

- (i) Work out the area of the cross-section.  
[2 marks]

(b)(i) \_\_\_\_\_ m<sup>2</sup>

**(ii) The width of the pool is 10 m.**



**Work out the capacity of the pool in litres.**

**(1 m<sup>3</sup> = 1000 litres)**

**[2 marks]**

**(ii) \_\_\_\_\_ litres**

- (c) After his swim, James rests in the hot tub.  
The cross-section of the hot tub is a regular 10-sided polygon.

Show that the interior angle of the polygon is  $144^\circ$ .  
[2 marks]

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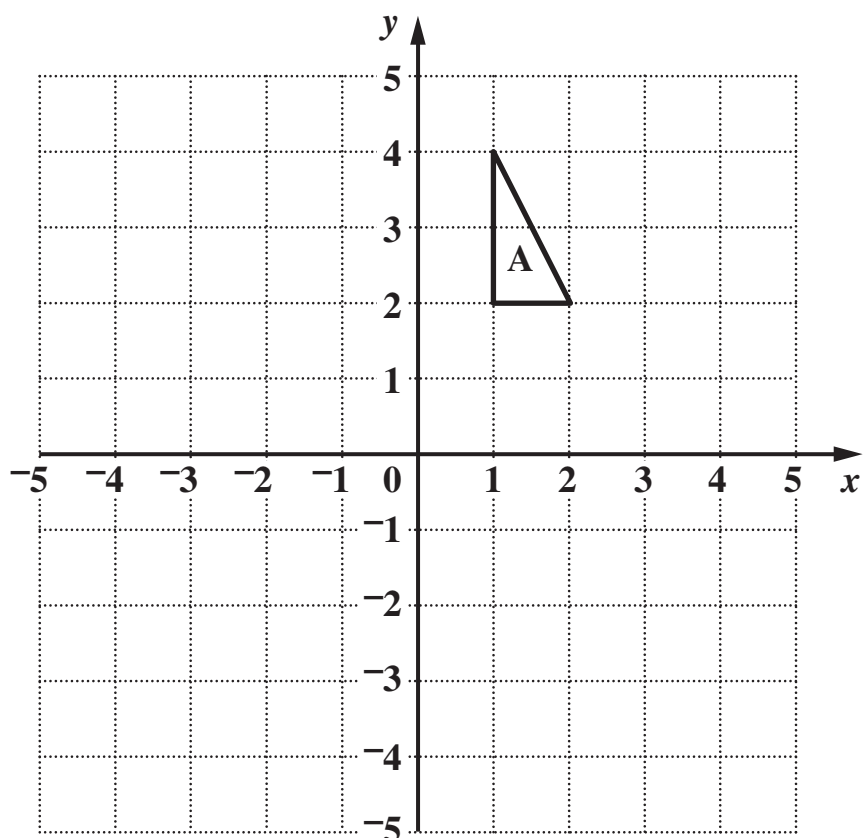
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- (a) Reflect triangle A in the line  $y = 0$ .  
Label the image B.  
[1 mark]
- (b) Rotate triangle A  $90^\circ$  anticlockwise with centre  $(0, 0)$ .  
Label the image C.  
[2 marks]
- (c) Describe fully the SINGLE transformation which maps triangle B onto triangle C.  
[2 marks]

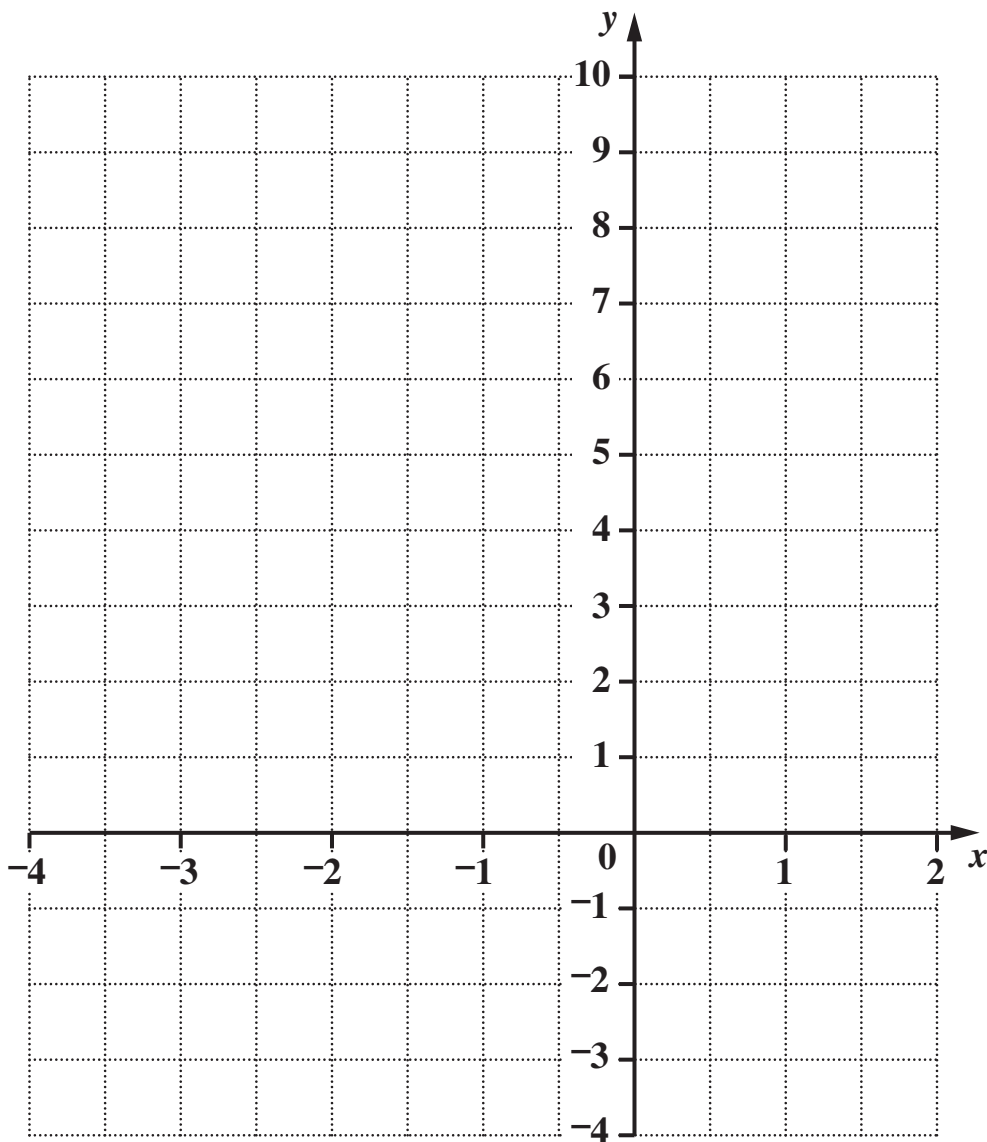
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- 6 (a) Complete this table for  $y = x^2 + 3x$ .  
[2 marks]

$x$	-4	-3	-2	-1	0	1	2
$y$	4	0	-2		0	4	

- (b) Draw the graph of  $y = x^2 + 3x$ .  
[2 marks]



- (c) Use your graph to solve the equation  $x^2 + 3x = 1$ .  
Write your answers correct to 1 decimal place.  
[2 marks]**

**(c) \_\_\_\_\_**

- 7 Pete has ordered some souvenir mugs to sell.  
They are delivered in boxes.  
When he opens the first box he finds a faulty mug, so he checks all the mugs in this box.**

<b>Condition</b>	<b>Number of mugs</b>
<b>Perfect</b>	<b>30</b>
<b>Faulty</b>	<b>18</b>

- (a) A mug is chosen at random from the first box.**

**Show that the probability that the mug is faulty is  $\frac{3}{8}$ .  
[1 mark]**

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- (b) Altogether Pete has ordered 400 mugs.**

**About how many would you expect to be faulty?  
Show your working clearly.  
[2 marks]**

**(b)** \_\_\_\_\_

**(c) Pete also ordered some souvenir pens.**

**The probability that a pen is faulty is  $\frac{1}{100}$ .**

**If Pete sold a mug and a pen without checking them first, what is the probability of BOTH the mug and the pen being faulty?  
[2 marks]**

**(c) \_\_\_\_\_**

**8 (a) Factorise and solve.**

$$x^2 - 5x - 14 = 0$$

**[3 marks]**

**(a)** \_\_\_\_\_

**(b) Solve algebraically.**

$$5x - 2y = 19$$

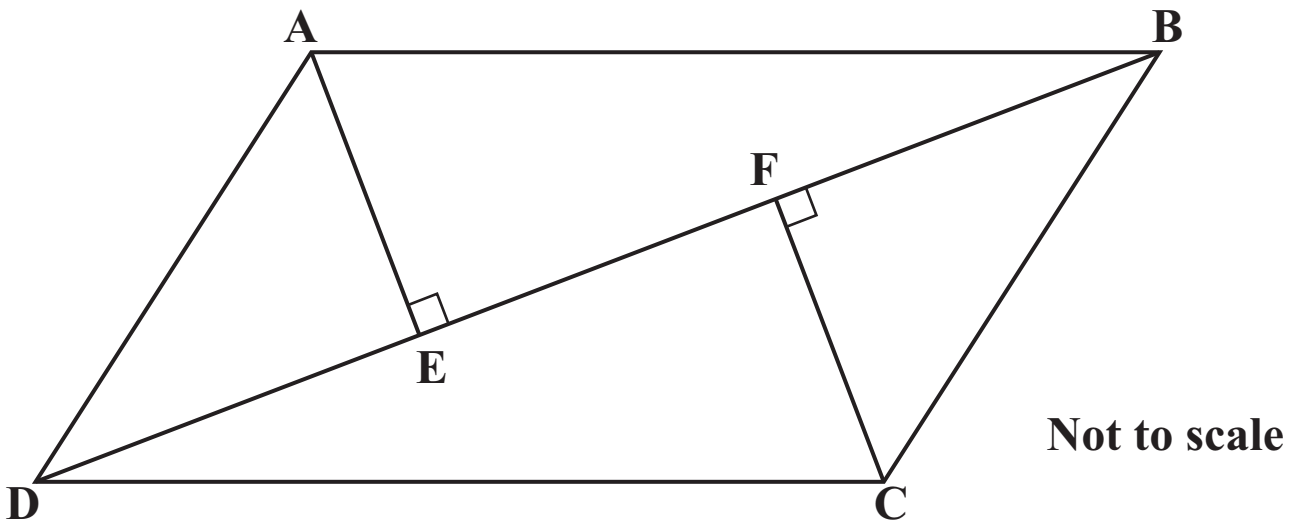
$$6x + y = 16$$

**[3 marks]**

**(b)  $x =$  \_\_\_\_\_**

**$y =$  \_\_\_\_\_**

- 9 **ABCD is a parallelogram.**  
**AE and CF are perpendicular to the diagonal BD.**



**Prove that triangles ABE and CDF are congruent.**  
**[3 marks]**

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**10 Work out.**

**(a) (i)  $7^0$**

**[1 mark]**

**(a)(i)** \_\_\_\_\_

**(ii)  $125^{-\frac{2}{3}}$**

**[3 marks]**

**(ii)** \_\_\_\_\_

**(b) Express  $0.\dot{4}2\dot{3}$  as a fraction in its simplest form.**  
**[3 marks]**

**(b)** \_\_\_\_\_

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